

Continuation of Weight Loss Treatment is Associated with the Number of Self-Selected Treatment Modalities

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Abstract

Behavior therapy is a cornerstone of weight loss treatment and behaviorists help direct patients' treatment. A novel design was used that allowed participants to choose different treatment modalities during behavioral weight loss treatment. The association between the selection of different treatment modalities and program completion was examined ($N=58$). Participants could choose five additional treatments options (two medications with or without meal replacements, or meal replacements alone). Participants changed treatments 3.5 times on average. Participants who completed the study changed treatments significantly more times than dropouts. Dropouts, however, tried more treatment options early in treatment compared to completers. Over time, participants chose more effective treatments. The results provide behaviorists with data on the benefits and costs of patients changing treatment modalities during treatment.

Keywords: Behavior therapy, Phenylpropanolamine, Caffeine, Ephedrine, Meal replacement, treatment preference.

The guidelines for the treatment of obesity suggest that behavior therapy, diet, and increased physical activity are cornerstones of weight loss treatment (NHLBI, 1998). Behavioral psychologists play a critical role in delivering and directing weight loss treatment in multidisciplinary settings. Therefore, behavioral psychologists must consider the benefits and costs of patients' desires to add various treatment modalities to behavior therapy. Other treatment modalities include meal replacements and medication. There is substantial variability of weight loss in response to these treatments and predicting weight loss success remains difficult (Martin, 2002). Nevertheless, patients who seek fee-for-service weight loss services must consider a number of treatment modalities and few studies have examined if patient preference for, and choice of, treatment modalities affects outcome.

Providing patients with the best possible care involves entering into a partnership with the patient, in which the patient and provider review treatment options and arrive at treatment strategies together. It appears that engaging the patient in treatment and fostering the patient's commitment contributes to a positive treatment outcome (e.g., motivational interviewing) (Ingersoll et al., 2005). Few studies, however, have studied the effects of treatment preference on weight loss. In a randomized trial, Renjilian et al. (2001) found that weight loss was not affected by assigning participants to their preferred or non-preferred treatment modality (group vs. individual therapy), and Burke et al. (2006) describe the design of a randomized trial that assigns participants to a preferred dietary approach, though weight loss data were not reported. To our knowledge, no study has examined: 1) the degree to which participants would change treatment modalities, if given the choice, 2) whether the number of times that people self-select different treatment options is associated with program continuation and completion, and 3) if participants choose more effective treatment options as treatment progresses.

The primary aim of this study was to conduct a unique group-based weight loss program that allowed participants to choose freely among a number of treatment options on a weekly basis, and to observe the number of times that treatments were changed. All participants were provided with behavior

therapy and they had the choice to add treatment options to this standard treatment regimen. It was hypothesized that participants who tried more treatment options would be more likely to complete treatment. This hypothesis was based on the following assumptions: 1) the efficacy of weight loss treatments will vary among participants, and participants who try more treatment options have a greater chance of finding one that works for them, thus increasing satisfaction with therapy and decreasing the likelihood of dropping out of treatment, 2) most participants will experience set-backs during treatment and those participants who are willing to try additional treatment options will be less likely to become discouraged and discontinue treatment, and 3) vicarious or social learning (Bandura, 1965) will allow participants to learn from the success and failure of other group members; therefore, participants will choose more successful weight loss treatments over time. Therefore, it was hypothesized that by the end of treatment a greater proportion of the participants would utilize treatments that are more effective at promoting weight loss compared to the beginning of treatment.

Methods

Participants

Fifty-eight participants with a body mass index (BMI; kg/m^2) above 27 and over 18 years of age enrolled in this 16-week study. Exclusion criteria included: 1) a diagnosis of diabetes, 2) body weight change of ± 4 kg in the 6-months prior to the study, 3) incapable of engaging in physical activity, and 4) use of monoamine oxidase inhibitors, beta-blockers, alpha-1 adrenergic inhibitors, or weight loss products or decongestants that contained phenylpropanolamine. All participants provided written informed consent and the study was approved by the Institutional Review Board of the Pennington Biomedical Research Center.

Weight Loss Therapy

Group therapy sessions led by clinical psychology graduate students were held weekly. A licensed clinical psychologist supervised the students. Registered dietitians also attended the group sessions and provided individual meal plans to participants. The treatment sessions were based on the LEARN manual and included behavior therapy and lifestyle modification. All participants received a copy of the *LEARN® Program for Weight Control 2000* (Brownell, 2000).

Participants had the option to rely on behavior therapy alone to lose weight, or they could work with their clinician and incorporate five additional treatment modalities at their discretion, including two medication options that were available at the time of the study without a prescription. The additional treatment choices or options included: 1) caffeine and ephedrine (C&E; 200 mg caffeine with 25 mg ephedrine HCl three times a day), 2) phenylpropanolamine (PPA; 75 mg daily), 3) C&E with meal replacements (MR), 4) PPA with MR, and 5) meal replacement shakes (Health-1, Health and Nutrition Technology, Carmel, CA). Prior to treatment, all participants underwent a medical exam to ensure their suitability to take medications. The physician associated with this research monitored side effects and medical issues. To ensure that both medications were tried by an equal number of participants, participants who chose medication were randomly assigned to either C&E or PPA for the first week, but they could change medications after this first week. A waist cord was also a choice for the first few weeks of the study, though this option was eliminated due to technical difficulties using the waist cord.

During the weekly group sessions, participants discussed their experiences with the treatment options and if their treatment options were helping them lose weight. Participants could also share with each other their success at reducing body weight. Each week, participants were allowed to select or discontinue meal replacements or either of the weight loss medications.

Results

Descriptive Characteristics of the Study Sample and Weight Loss

Sixty-three participants were screened for participation in this study and fifty-eight participants enrolled. Participants ranged in age from 24 to 72 years and the sample was predominately female ($n = 51$; 87.9%), and 58.6% ($n = 34$) of the sample was white and 41.4% ($n = 24$) was African American. Baseline (week 0) BMI and age did not differ by gender (p values $> .12$). The descriptive characteristics of the sample are presented in Table 1.

Table 1. Characteristics of study participants.

	Total Sample ($N = 58$)	Men ($n = 7$)	Women ($n = 51$)	p value comparing men and women
Mean Age (years)	44.5	50.3	43.7	.13
Mean Weight (kg)	105.2	108.7	104.7	.72
Mean BMI (kg/m^2)	40.0	35.3	40.7	.19

Note. One-way analysis of variance was used to compare men and women on age, baseline body weight, and BMI.

Forty participants (69%) completed the 16-week program. Completers were defined as having attended and been weighed at one of the last two sessions (completers attended or made-up 89.4% of the sessions). Program completers did not differ significantly from dropouts on age or baseline BMI (p values $> .10$) or proportion of males to females, $\chi^2(1) = 0.02$, $p = .88$. Participants who completed the trial lost 7.3 ± 5.67 (\pm standard deviation or SD) kg or 6.8 ± 4.8 percent of initial body weight over the 16 weeks of treatment. Dropouts lost significantly less weight (2.2 ± 2.1 kg or $2.2 \pm 2.2\%$) compared to completers ($p < .01$) (percent weight loss was calculated for dropouts using their week 0 weight and their last available weight).

Selection of Different Treatment Options, Attrition, and Weight Loss

During the study, 74.1% and 91.4% of all participants chose medication and meal replacements, respectively. Only one participant chose to rely solely on the standard therapy, and this participant dropped out of treatment after seven weeks. On average, participants changed treatments 3.5 ± 1.9 (SD) (Minimum = 1, Maximum = 9) times and they tried 2.5 ± 0.90 (Minimum = 1, Maximum = 5) different treatments.

Completers changed treatment options a significantly greater number of times compared to dropouts (Table 2). The total number of treatments tried, however, did not differ between completers and drop-outs and was virtually identical. To determine if completers changed treatments more times simply because they were in treatment for a longer duration, the same comparisons were made at week 6, since the mean week of dropout was 5.5 ± 2.7 . This analysis demonstrated the opposite pattern; completers changed treatment options non-significantly ($p = .13$) fewer times than drop-outs (Table 2). Additionally, at week 6, completers tried significantly fewer treatments compared to drop-outs. Analyses also were conducted that only included the dropouts who had terminated treatment on or before week 6 and the results were very similar. Percent weight loss was not correlated with the number of times that participants changed treatments ($r = 0.05$, $p = .73$) nor the number of treatments tried ($r = 0.02$, $p = .87$), and these correlations remained non-significant when analyzed separately for completers and dropouts, unsurprising due to the restricted range of these data.

Table 2. The mean (SD in parentheses) number of times participants changed treatments and the number of treatments utilized for completers and drop-outs.

	Completers (n = 40)	Drop-outs (n = 18)	<i>p</i> value
Total # of times treatments were changed (mean)	3.8 (2.2)	2.7 (0.83)	< .05
Total # treatments utilized (mean)	2.6 (1.0)	2.4 (0.6)	.53
# of times treatments were changed by week 6 (mean)	1.9 (0.9)	2.3 (0.9)	.13
# of treatments tried by week 6 (mean)	1.7 (0.7)	2.1 (0.8)	< .05

Note. One-way analysis of variance was used to compare men and women on age, baseline body weight, and BMI.

Average weekly percent weight loss was calculated for the standard therapy alone option and each of the five additional treatment options (Table 3). These weekly means were also summed to represent total percent weight loss across the 16 weeks for each treatment option (Figure 1). Analysis of variance demonstrated that the behavior therapy alone, C&E, and C&E plus MR options lost significantly more weight each week on average compared to the PPA option (Table 3). This effect is also illustrated by the total average weekly weight losses for the treatment options (Figure 1).

Mean Percent of Participants who Chose Different Treatment Options

Table 3. Mean weekly percent weight loss for each treatment option.

	Mean weekly percent weight loss for each treatment options.					
	Behavior Therapy	C&E	C&E plus MR	MR	PPA	PPA plus MR
Mean	-0.54 ^{a±}	-0.56 ^a	-0.68 ^a	-0.33 ^{ab}	-0.15 ^b	-0.49 ^{ab}
SD	0.54	0.62	0.58	0.30	0.73	0.58

Note. C&E = caffeine and ephedrine; C&E plus MR = caffeine and ephedrine plus meal replacements; MR = meal replacements; PPA = phenylpropanolamine; and PPA plus MR = PPA plus meal replacements.

Means with different superscripts differ significantly ($p < .05$).

[±] $p = .05$

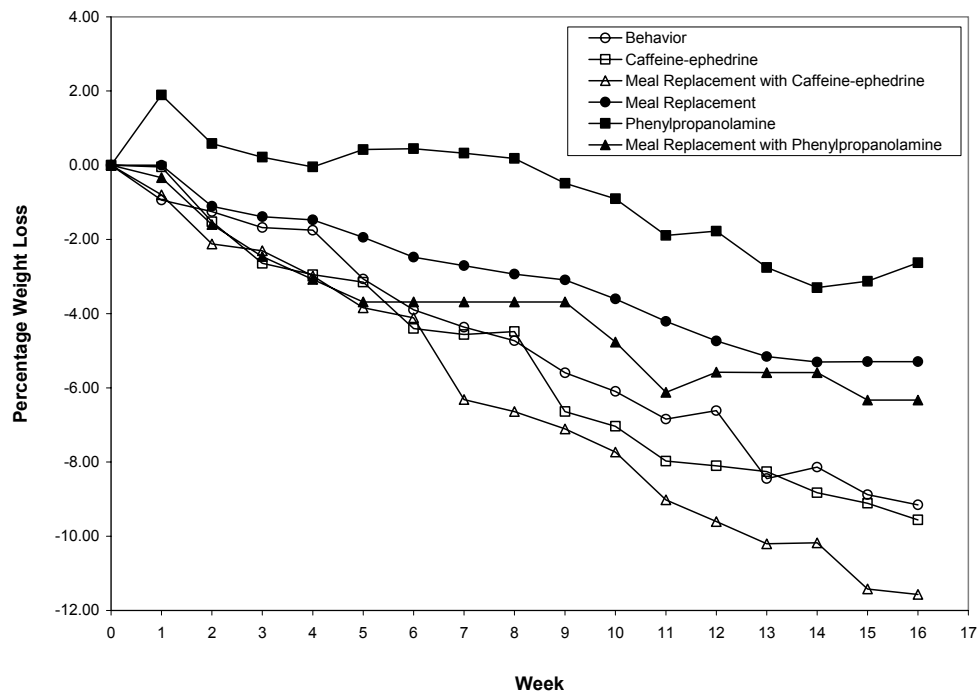


Figure 1. Cumulative weight loss by treatment across the 16-week trial.

Figure 2 illustrates the percentage of participants who chose each treatment option at each week of treatment. To reduce the complexity of Figure 2, the two options that included C&E (C&E and C&E plus MR) and PPA (PPA and PPA plus MR) were combined. As illustrated in Figure 2, the percentage of participants choosing each treatment option varied, but, on average, the percentage of participants relying on the highly effective standard therapy alone and the C&E options increased, while the percentage of participants relying on the less effective MR and the PPA options decreased.

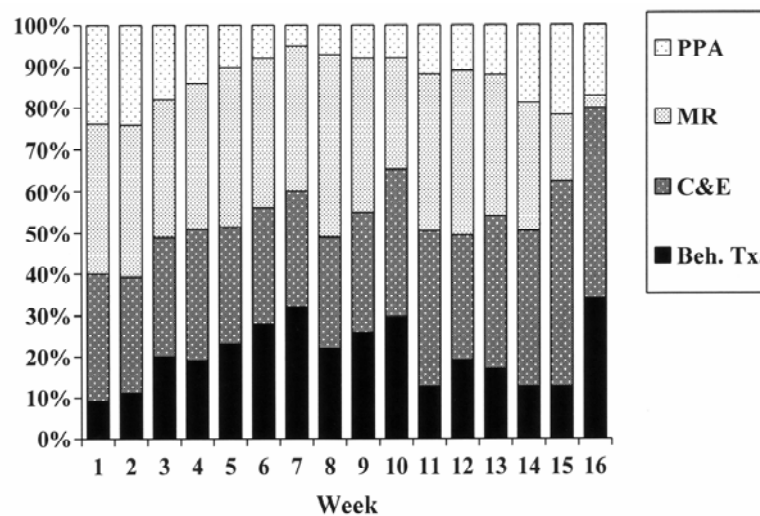


Figure 2. Percentage of subjects on each treatment across the 16-week trial.

Note. Beh. Tx. = Behavior therapy alone; MR = meal replacement alone; C&E = caffeine and ephedrine; PPA = phenylpropanolamine. To reduce the complexity of the figure, the options that included C&E (C&E and C&E plus MR) and PPA (PPA and PPA plus MR) were combined.

Discussion

To our knowledge, this is one of the first studies that allowed participants to work together with a clinician to choose the type of treatment that they received during the course of therapy and to record the number and type of treatment options selected. The majority of participants (74.1%) tried medication and almost all (91.4%) of the participants chose meal replacements during the trial. Only one participant relied solely on behavior therapy.

On average, participants changed treatments 3.5 times, and participants who completed the study changed treatments significantly more times than dropouts. Early in treatment, however, completers changed treatments non-significantly fewer times than dropouts, and completers tried significantly fewer treatment options compared to dropouts. The results suggest that dropouts tried more treatment options early in treatment for short periods of time, and they likely concluded, possibly prematurely, that the treatment options were ineffective. These factors could have contributed to discontent with treatment and attrition. Completers tried fewer treatment options early in the program and they appeared to have used treatments for longer periods of time, which likely provided the participants with more information about the effectiveness of the treatment option. Additionally, completers ultimately tried more treatment options than drop-outs, which likely allowed them to find a treatment combination that they found effective. It is possible that these findings reflect a dispositional trait or the ability of participants to adhere to treatment recommendations and realize their weight loss expectations, all of which should be the focus of clinical attention to decrease attrition and improve treatment efficacy.

The results of this study demonstrate also that the proportion of people who select certain treatment options during treatment varies widely, but by the end of treatment people select the treatment options that are more effective at promoting weight loss. Figure 2 illustrates that the options including C&E had an increase in the proportion of participants who used these treatments, while the less effective PPA treatments had a decrease in the proportion of participants who selected these treatments. This finding is noteworthy, since an equal number of participants started medication treatment with C&E and PPA by design.

Providing participants with the choice to guide their treatment in a social context (group therapy) allowed participants to discuss the pros and cons of different treatment strategies with their peers and clinician to make informed decisions about treatment options. Additionally, participants were able to vicariously learn from their peers and observe the success and failure of group members. Participants who completed the study lost a considerable amount of body weight (6.8%) over a relatively brief 16-week program, and the weight loss achieved in this study is commensurate with other successful programs. In a review of behaviorally oriented weight loss programs, Wadden et al. report that participants lost 10% of their initial body weight over 31.4 weeks, almost twice the period of time in this study (2004), and Womble et al. report weight loss of 3.6% at week 16 in a low-intensity program that utilized the LEARN Manual (2004). Caffeine and ephedrine has been found to produce weight loss of 9% of initial body weight at 15 weeks (Breum, Pedersen, Ahlstrom, & Frimodt-Moller, 1994), which translates into a rate of weight loss (-0.6%/wk) that is very similar to the rate of weight loss associated with C&E in this study (-0.56%).

The findings of this study must be interpreted in the context of its limitations. First, there was considerable attrition (31%). Second, the sample size was relatively small. Finally, the unique design of

this study could be viewed as a liability, but the design was required to test the hypotheses and it is similar to fee-for-service weight loss programs where many treatment options are available and the patient has substantial control in determining the course of treatment, thus increasing external validity.

In summary, the results of this study provide descriptive data on the number of times that patients change treatment modalities when given the choice, and these data provide clinicians and interventionists with information to identify patients who have a greater likelihood of prematurely terminating treatment. Specifically, the results of this study suggest that patients at risk for premature treatment termination prefer to change treatment options early in treatment, yet they ultimately do not try as many treatment options as those who complete treatment. Therefore, it appears that over the course of treatment drop-outs try fewer treatments for shorter periods of time compared to completers. Consequently, the ability of drop-outs to find an effective treatment regimen and be satisfied with treatment is limited. These data can be used by clinicians to identify potential drop-outs and provide services to help them remain in treatment.

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